



RALS™ Specifications for Customer Provided Environments

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Abbott Rapid Diagnostics (ARDx) Informatics

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The purpose of this document is to provide requirements for configuring a physical or virtual server to run the RALS™ point-of-care management system. It also describes the RALS database setup, as well as the accounts and permissions that are necessary.

1. Minimum RALS™ Specifications for Servers

The minimum specifications for the servers are as follows:

System	Configuration Requirements			
CPU	4 CPU cores (Intel Xeon 3.00GHz+ or equivalent)			
OS Version	Microsoft Windows Server 2016 Standard 64-bit or later			
Cryptography	TLS 1.2 must be enabled along with the compatible cipher suites. TLS 1.0 and 1.1 not required			
Disk Space (OS Drive)	Single Tier RALS Application Database resides on the same machine		Multi-Tier Database hosted on a different machine	
	Minimum disk space is 150 GB		Minimum disk space is 150 GB for the application server	
Disk Space Data/Application Partition(s)	Single Tier RALS Application Database resides on the same machine		Multi-Tier Database hosted on different machine	
	Minimum disk space is 200 GB		Minimum disk space is 50 GB for the application server	
RAM Size	Single Tier RALS Application Database resides on the same machine		Multi-Tier Database hosted on different machine	
	# of Devices	Minimum RAM (GB)	# of Devices	Minimum RAM (GB)
	<50	8	<600	8
	50-599	12	600+	16
	600-799	16		
	800-1199	20		
	1200-1599	24		
	1600-1999	28		
	2000+	32+ (contact Customer Support)		



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SQL Server	<p>RALS supports SQL Server 2019 or later. Standard edition or higher is recommended for large databases and customers who are hosting SQL centrally. RALS is compatible with SQL Server's transparent data encryption (TDE), which is not available on SQL Server Express. SQL Server Express is supported for smaller customers (DB size less than 10 GB). RALS is capable of installing SQL Server Express if your organization has elected to not provide a SQL Server instance.</p> <p>SQL Server must have the following Instance and Shared Features installed:</p> <ul style="list-style-type: none">• Database Engine• Client Tools Connectivity• Client Tools SDK• SQL Client Connectivity SDK• Client Tools backwards compatibility <p>The SQL Server instance must have the following settings:</p> <ul style="list-style-type: none">• The default collation setting is case-insensitive (CI)
Web Server (IIS)	<p>The following Windows Roles/Features must be enabled for the Web Server (IIS) server role:</p> <ul style="list-style-type: none">• Common HTTP Features<ul style="list-style-type: none">○ Default Document○ HTTP Errors○ Static Content• Health and Diagnostics<ul style="list-style-type: none">○ HTTP Logging○ Request Monitor• Performance<ul style="list-style-type: none">○ Static Content Compression• Security<ul style="list-style-type: none">○ Request Filtering○ IP and Domain Restrictions• Application Development<ul style="list-style-type: none">○ .NET Extensibility 3.5○ .NET Extensibility 4.6○ ASP.NET 3.5○ ASP.NET 4.6



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	<ul style="list-style-type: none">○ ISAPI Extensions○ ISAPI Filters• Management Tools<ul style="list-style-type: none">○ IIS Management Console
TCP Settings	<p>The default connection heuristics found within the Windows TCP template settings must be modified to support connectivity for certain instrument types to RALS. The TCP template settings on the RALS server should be adjusted to utilize the "Internet" transport filter for instrument connections targeting port 3001. The following PowerShell command (executed as an administrator) may be used to create the appropriate transport filter settings:</p> <pre>New-NetTransportFilter -SettingName Internet -LocalPortStart 3001 -LocalPortEnd 3001 -RemotePortStart 0 -RemotePortEnd 65535</pre>

2. RALS Databases

The following databases are created during a RALS installation. Let an ARDx Informatics representative know if a different database name is preferred. Note that database names should not have spaces.

Database	Usage
History	Contains the tables for the history of each resource
HL7InMsg	Stores the received ADT messages for debugging purposes
LDAP	Stores the LDAP credentials and communication sessions for debugging purposes
LMS	Stores the LMS communication sessions for debugging purposes
Logs	Stores the access and debug logs for the RALS system
MIG	Stores the device communication sessions for debugging purposes
Mirth	Stores the configuration and communication sessions for the Mirth application
RALS	Primary database for RALS data

Warning: After installation, do not change database names without contacting Abbott Rapid Diagnostics Informatics!

Note that the RALS Installer will set the capacity for each of the following databases to 9600 MB: History, HL7InMsg, LDAP, LMS, Logs, and Mirth.

3. Set up the RALS Databases

Decide where to store the RALS databases from the options below:

- Multi-Tier: Remote SQL server



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- Single Tier: Same as the RALS Application
- Abbott/RALS Managed Database: If this option is selected, a local SQL Server 2019 Express instance will be included during the RALS application installation.

Note that if your organization is setting up a system with a remote SQL server, the SQL server and the RALS application server must utilize the same time zone.

3.1. Folder Locations

The following folder locations are required in order to perform a RALS installation or upgrade in either local or remote database configurations. Before RALS is installed, an ARDx Informatics representative will need to know the following information:

1. **RALS Installation Location** (Location of RALS once installed)
 - a. Drive and Folder
NOTE: It is recommended to have RALS installed on a different drive than Windows OS.
 - b. RALS Application Installer files should not be deleted
2. **File Share Location** (used to store report PDFs and device files)
 - a. UNC path, or preferred local Drive and Folder location (see [File Share Permissions](#) section for a list of service accounts who will need Modify permissions to this folder)
NOTE: the File Share name should not change after installation; it will break communication with the server.
3. **DE Server Name/IP for i-STAT functionality** (only required if your organization supports the i-STAT device)
 - a. **IP Address or Host Name of DE Server** (no specific name required for the DE; it can follow your organization's naming convention)
NOTE: the DE Server name should not change after installation; it will break communication with server.
4. **Learning Management System (LMS) File-Based Path** (only required if your organization supports a file-based LMS system)
 - a. UNC path, or preferred local Drive and Folder information (see [File-Based Learning Management System](#) section for a list of account users who will need Modify permissions to this folder)
NOTE: the Learning Management System folder name should not change after installation; it will break communication with the server.

3.2. Database Setup

1. **Restore the RALS databases** individually (for a list of databases and descriptions, see [RALS Databases](#))
 - a. An ARDx Informatics representative will provide your organization with the database backup file to restore for RALS version 8.x.x. This file contains backups for all RALS user databases. Run *Restore Headeronly* on the file to check the file number for each database for database restore.



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- b. Optionally, if your organization has specific naming requirements for databases, the names can be changed. The new names will need to be provided to an ARDx Informatics representative prior to the RALS application install.

NOTE: do not change database names after installation without contacting an ARDx Informatics representative.

2. Create a SQL Database Admin login to be used for installing RALS.
 - a. Your organization should create a login. This login should be a member of sysadmin role.
 - b. This login and password must be communicated to an ARDx Informatics representative before RALS installation.
 - c. This login can be dropped after the installation is completed.
 - d. The RALS Installer will create a login, RALSAdmin. This login will be the database owner for all RALS user databases and will be granted the View Server State Permission. This login should not be altered or dropped.
 3. **Identify Service and API Accounts** (see [Service Accounts](#) for a complete list)
RALS supports the following account types:
 - a. Local Virtual Service Accounts (RALS creates these local virtual service accounts)
 - i. These accounts are supported on local databases, and not supported on remote databases.
 - ii. RALS Installer will automatically create SQL logins for the service accounts.
 - iii. If RALS is deployed on an Abbott provided server, this setup can be used.
 - iv. If RALS is deployed on a single customer server, this setup can be used.
 - b. Domain accounts (your organization is responsible for creating the domain accounts)
 - i. RALS Installer automatically sets these accounts to run as a service.
 - ii. RALS Installer will automatically create SQL logins for the accounts.
 - iii. For domain accounts, an ARDx Informatics representative will need the desired login information before the installation process.
 4. Ports
 - a. SQL Port 1434 is used by SQL Server Browser, and must be open prior to installation or upgrade. In addition, the port for SQL Server must be open. This is required only in multi-tier configurations.
 5. Backups
 - a. Your organization is responsible for backups.
 - b. Back up all the RALS-related databases at least once a day.
 6. RALS supports HTTPS for secure encrypted website to browser communication
 - a. If using HTTPS, the certificate must be bound to the website within IIS in order for the RALS Installer to properly configure the application.
 - b. If no certificate is bound, then RALS will not be configured for HTTP only.



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4. Appendix

4.1. Service Accounts

There is no need to create database accounts for local databases utilizing default accounts (NTService and Application Pools Accounts).

If setting up a remote database or a local database with custom accounts, your organization will need to set up their own accounts. After setting up the service accounts, your organization will need to grant permissions to the service accounts. ([See section 4.2 Access this Computer from the Network](#)).

If using a local or remote database with custom accounts, the ARDx Informatics representative will need the user ID and password for the accounts prior to RALS installation.

See the table below for a list of all RALS service accounts.

Note: All of the listed accounts are required unless otherwise specified:

Account	Description of Service or API	Notes
Account	Service that converts the raw received patient transactions into a format used by the system	<ul style="list-style-type: none">• Associated with RALS Account service• User ID must be unique, and a unique password is preferred• If the database is remote, the user needs “Access this computer from the network” policy
Auth	Service that grants and authenticates OAuth2 JSON web tokens	<ul style="list-style-type: none">• Associated with Auth API• User ID must be unique, and a unique password is preferred• If the database is remote, the user needs “Access this computer from the network” policy
Data	An Application Programming Interface (API) for creating, retrieving, and modifying resources	<ul style="list-style-type: none">• Associated with Data API• User ID must be unique, and a unique password is preferred• Note that this user must be added to the File Share folder with Modify permissions



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Account	Description of Service or API	Notes
		<ul style="list-style-type: none">Note that this user might need Modify permissions on the LMS directory if LMS is file-basedIf the database is remote, the user needs “Access this computer from the network” policy
Evaluator	An application that provides a real-time display of MIG service activity and status	<ul style="list-style-type: none">Associated with the RALS Evaluator serviceUser ID must be unique, and a unique password is preferredIf the database is remote, the user needs “Access this computer from the network” policy
HL7Inbound	A service that receives ADT data from external systems	<ul style="list-style-type: none">Only required when RALS will be connected to an ADT feedAssociated with the RALS HL7Inbound serviceUser ID must be unique, and a unique password is preferredIf the database is remote, the user needs “Access this computer from the network” policy
HL7Outbound	A service that sends outbound result data to external systems	<ul style="list-style-type: none">Only required when RALS will be connected to a downstream system (LIS, EMR, etc.)Associated with the RALS HL7Outbound serviceUser ID must be unique, and a unique password is preferredIf the database is remote, the user needs “Access this computer from the network” policy
i-STAT	An application that provides a real-time display of the i-STAT Interface service activity	<ul style="list-style-type: none">Associated with the i-STAT serviceUser ID must be unique, and a unique password is preferred



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Account	Description of Service or API	Notes
		<ul style="list-style-type: none">• If the database is remote, the user needs “Access this computer from the network” policy
LDAP	An API for requesting synchronizing with the customer’s Lightweight Directory Access Protocol (LDAP)	<ul style="list-style-type: none">• Associated with LDAP API• User ID must be unique, and a unique password is preferred• If the database is remote, the user needs “Access this computer from the network” policy
Logging	An API for capture of logging information and errors	<ul style="list-style-type: none">• Associated with Logging API• User ID must be unique, and a unique password is preferred• If the database is remote, the user needs “Access this computer from the network” policy
MIG	A service that communicates with external analyzers and data managers/device concentrators over TCP/IP sockets	<ul style="list-style-type: none">• Associated with the RALS MIG service• User ID must be unique, and a unique password is preferred• If the database is remote, the user needs “Access this computer from the network” policy• Note that this user account must be added to the File Share folder with Modify permissions.
Mirth Connect	A service that allows ARDx Informatics Interfacing to customize the ADT/Order inbound messaging and result outbound processing to the customer’s unique environment	<ul style="list-style-type: none">• Associated with the RALS Mirth Connect service• User ID must be unique, and a unique password is preferred• If the database is remote, the user needs “Access this computer from the network” policy



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Account	Description of Service or API	Notes
Patient Purge	A service that permanently removes patient demographic information from the system based on configured criteria	<ul style="list-style-type: none">• Associated with RALS Patient Purge service• User ID must be unique, and a unique password is preferred• If the database is remote, the user needs “Access this computer from the network” policy
Periodic Task	A service that executes a variety of tasks on a periodic basis, including operator recertification, LDAP synchronization, task execution, etc.	<ul style="list-style-type: none">• Associated with the RALS PeriodicTask service• User ID must be unique, and a unique password is preferred• Note that this user might need Modify permissions on the LMS directory if LMS is file-based.• If the database is remote, the user needs “Access this computer from the network” policy
Reports	A service that processes report generation requests	<ul style="list-style-type: none">• Associated with the RALS Reports service• User ID must be unique, and a unique password is preferred• If the database is remote, the user needs “Access this computer from the network” policy• Note that this user account must be added to the File Share folder with Modify permissions.
Status	A service that reports the ping status of RALS download points and liveness status of legacy ADT and LIS services	<ul style="list-style-type: none">• Associated with the RALS Status service• User ID must be unique, and a unique password is preferred• If the database is remote, the user needs “Access this computer from the network” policy



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Account	Description of Service or API	Notes
Translate	An API for retrieving translated text based on the requested language	<ul style="list-style-type: none">• Associated with Translate API• User ID must be unique, and a unique password is preferred• If the database is remote, the user needs “Access this computer from the network” policy

4.2. “Access this computer from the network” Permissions

For remote databases, your organization will need to grant permission to the service accounts for “Access this computer from the network policy” in the Local Security Policy app. Here is a list of the service accounts that need the permission:

- Account
- Auth
- Data
- Evaluator
- HL7Inbound
- HL7Outbound
- i-STAT
- LDAP
- Logging
- MIG
- Mirth Connect
- PatientPurge
- PeriodicTask
- Reports
- Status
- Translate

4.3. File Share Permissions

The File Share folder is used by RALS to store report PDFs and device files.

If RALS is on a single machine with a local file share, with local virtual service accounts, there is no need to set up the Modify permissions for any scenario (default or custom domain).



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If the file share is going to be accessed by domain accounts, the accounts that are set up for the following services must be added to the file share location with the Modify permissions:

- i. The account associated with RALS Data
- ii. The account associated with RALS MIG
- iii. The account associated with RALS Reports

A remote file share is not supported when using local virtual service accounts.

4.4. File-Based Learning Management System (LMS)

RALS supports the HealthStream LMS, and a File-Based LMS. If your organization is using HealthStream, then no further action is required on your part.

If RALS is set up with local virtual service accounts, then no further action is needed to set up Modify permissions.

If RALS is set up with domain accounts, the following accounts must have Modify permissions on that directory:

- i. The account associated with RALS Data
- ii. The account associated with RALS Periodic Task